Talking Points for Dr. Buchanan: Vavilov Forum Oct. 23, 2008
1:30-3:30 pm National Agricultural Library
Beltsville, MD 20705

The United Nation's Food and Agriculture Organization estimates of the 300,000 plant species on Earth, 12 crop species provide approximately 80% of the world's food[1].

This narrow genetic base leaves global food security vulnerable to disasters resulting from political upheavals and the forces of nature: drought, hurricanes, fire, global climate change, invasive species; pests and diseases. Famine is never far from our doorsteps.

We are here today to honor the life and achievements of Nikolai Vavilov. Vavilov collected plant materials from five continents building the largest plant seed bank. During his lifetime Russia experienced three major famines: 1891-92; 1921; and 1932[2]. The 1921 famine, the result of drought killed an estimated 5 million; the 1932 famine affected more than 40 million and killed between 5 to 10 million people and was the result of Stalin's collectivization of Soviet agriculture.

[1] R.C. Johnson (2008) Gene banks pay big dividends to agriculture, the environment, and human welfare. PLoS Biol. 6(6):e148. doi: 10.1371/journal.pbio.0060148
[2] http://en.wikipedia.org/wiki/Droughts_and_famines_in_Russia_and_the_USSR

Global gene banks are a buffer against the vicissitudes of nature and man; a necessary insurance policy. Following World War II, Congress established within the Department of Agriculture a system of repositories to maintain and distribute plant genetic resources. Today, the USDA, National Plant Germplasm System has 26 repositories with approximately 500,000 individual collections[3].

These collections serve their purpose:

Examples:

Teff is an African food and forage staple providing gluten-free pancake flour used in traditional food. In the late 1980's, USDA's collections restored 336 Ethiopian teff accessions to an Ethiopian gene bank decimated through political upheaval. The accessions were collected by USDA scientists in the 1960's[4].

Also in the 1980's a major sugar beet rhizomania disease emerged in North America, initial breeding developed varieties resistant to the disease using a single gene *Rz1*. Single gene resistance left the crop highly vulnerable to the fungus which developed resistance to *Rz1* in 2002. Materials collected in 1952 from Turkey and an

[3] R.C. Johnson Ibid
[4] R.C. Johnson Ibid

accession collected in Denmark in 1985 are now providing the next line of defense against this pest[5].

I am pleased to welcome you to this afternoon's forum the, "Plant Explorations of Nikolai Vavilov and the Value of Gene Banks Today". We are meeting in the beautiful and stimulating setting of the National Agricultural Library, which serves a similar mission in protecting intellectual capital and our collective investments in research.

[5] R.C. Johnson Ibid